PUBLICATIONS OF THE SCOTTISH COUNCIL
FOR RESEARCH IN EDUCATION

XXIV

# THE SCOTTISH COUNCIL FOR RESEARCH IN EDUCATION

## ITS AIMS AND ACTIVITIES

70-P
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UNIVERSITY OF LONDON PRESS, LTD.
WARWICK SQUARE, LONDON, E.C. 4
1947

PRICE ONE SHILLING NET

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Printed in Great Britain by
Neill & Co., Ltd., Edinburgh.

# FOREWORD

In the post-war world important changes are envisaged in the structure and content of Education and its relation to the social, economic and industrial life of the people. Here, as in other spheres, Research may be expected to play a useful part. To the Scottish Council for Research in Education, accordingly, the time seems appropriate for issuing this record of the aims it has been pursuing and the work on which it has been engaged during the seventeen years of its existence. The record, it is hoped, may be of interest, and possibly service, to present and future workers in the same field.

A feature of the Council has been the comprehensiveness of the educational interests represented on its membership. This has greatly widened the scope of its inquiries, and enabled it to remit particular problems to panels, with associate workers, specially qualified to deal with them.

The moving spirit from the beginning has been the Director, Dr Robert R. Rusk; and the Council takes this opportunity of acknowledging the untiring zeal and conspicuous ability with which he has inspired, guided and co-ordinated its diverse activities. To his profound knowledge of educational history and theory, his intimate acquaintance with educational literature and research at home and abroad, his ability to produce facts and considerations relevant to the inquiries on hand, his careful management of the business and unfailing courtesy to the members, must be ascribed a large share of any success the Council may have achieved.

DAVID FREW,
*President.*

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# INTRODUCTION

The recognition accorded to educational research in the Education (Scotland) Bill, 1945, makes this an opportune occasion to review the activities of the Scottish Council for Research in Education.

## *Origin and Constitution*

In May 1927 the Association of Directors of Education in Scotland approached the Research Committee of the Educational Institute of Scotland, at a moment when it was contemplating a similar approach to the Association of Directors, suggesting collaboration in educational research. The ground for such a proposal had been prepared, not only by the existence of the Research Committee of the Institute since 1919 adumbrated in *Reform in Scottish Education* published in 1917, but also by the interest in research stimulated by the institution of degrees in Education in Scotland, the ordinance for which was passed in 1916. A joint meeting was held on 6th May, at which it was decided to extend an invitation to the Association of Education Authorities in Scotland to co-operate, and, the invitation being accepted, two representatives from each body were appointed on 27th October 1927 for the purpose of approaching the Scottish Education Department. It was later recommended that the basis of representation should be further broadened by the inclusion in the Research Council of other interests, namely, the Association of County Councils in Scotland, the Association of Counties of Cities in Scotland, the National Committee for the Training of Teachers, Training Centres and Colleges, the Universities, the Scottish branch of the British Psychological Society and the Association of School Medical Officers of Scotland. (See Appendix I.) The first meeting of the Council was held on 23rd June 1928.

The Scottish Council for Research in Education was incorporated as a Limited Company by Certificate of the Board of Trade (No. 17067), dated 8th December 1932.

In its Articles of Association the Council acquired extensive powers, but has in practice restricted itself to the aims set forth in the original constitution, namely, to encourage and organise research work in education in Scotland, and, in particular, to initiate and control special investigations, making the necessary arrangements with the relative Education Authority; to receive suggestions for research; to allocate problems to suitable investigators; to finance approved investigations, wholly or partly; and to authorise the publication of results and recommendations and to bear the cost of such publication.

The Council was at an early stage recognised abroad as a body of national and international standing, and in 1931 was invited by the International Institute of Teachers College, Columbia University, New York, to undertake for Scotland investigations into various aspects of examinations for the International Examinations Inquiry.

### *Finance*

In May 1928 the Educational Institute of Scotland, at its Annual General Meeting, agreed to be responsible for a sum of not less than £500 and not exceeding £750 towards the expenses of the Council. This guarantee enabled the establishment of the Research Council to be consummated. In 1938 the basis of the grant made by the Institute was changed to 7d. per member, the sum annually received thereafter varying from £760 to £690.

The Secretary of the Scottish Education Department indicated on 12th March 1928 that the Department were prepared to allow individual Education Authorities to make contributions to the Council under Section 9 of the Education (Scotland) Act, 1918, and the Association of Education Authorities in Scotland agreed at their Executive Meeting of 19th December 1928 to recommend to the favourable consideration of Education Authorities the Council's suggestion that the Authorities should contribute to the funds of the Council on the basis of ¼d. per pupil.

The total income derived from grants by Education Authorities has varied from £513 to £848 until 1944, when an appeal was made to the Authorities to consider an increase in their grant. Several made an immediate increase, with the result that the Council's income from this source amounted in 1944 to £941. Other Authorities promised an increase in the following year.

The total appropriations received during the period from 1931 to 1941 from the International Institute of Teachers College for the International Examination Inquiry's investigations and publications amounted to £5,157. Without these generous subsidies the major investigations of the Council could not have been undertaken.

From all these sources, with the addition of sundry small grants and donations and receipts from publications, the average annual income of the Council amounts to some £1,500.

The expenses of the Council come under three headings: (*a*) office expenses, including salaries; (*b*) research expenses, including the cost of researches undertaken on behalf of the Council subsidised by the payment of travelling expenses incurred, clerical assistance, and cost of material; (*c*) publications. In sixteen years the Council has published twenty-four volumes and ten supplements to the *Scottish Educational Journal.*

### *Staff*

The staff comprises an Honorary Director, a full-time secretarial assistant and a full-time clerkess. The Director attends meetings of Council and of all Committees, and prepares the agenda and drafts the minutes. He deals with all inquiries requiring technical knowledge, grants interviews to students seeking guidance or assistance in research projects, and to visitors from abroad desirous of becoming acquainted with the activities of the Research Council or investigating the Scottish educational system. He also reports on topics for submission to the various Committees, prepares the Annual Reports and sees all the Council's publications through the press. The secretarial assistant deals with the administrative aspect of the Council's correspondence and with the financial intromissions of the Council. The clerkess assists with the compilation and reduction of data in investigations undertaken or sponsored by the Council.

The General Secretary of the Educational Institute of Scotland acts as Honorary Secretary and Treasurer.

The income of the Council does not at present permit of the engagement of trained research workers or statisticians, and but for the voluntary help given most generously by members of Council and co-opted members of Committees the volume of output could not have been maintained.

Throughout its course the Council has deliberately refrained from converting itself into a test-producing bureau, since this would have entailed the employment of a full-time technical staff, and would have tended to divert its energies from its proper functions.

Office accommodation is provided at a nominal charge by the Educational Institute.

### *Publications*

At the outset of its deliberations the Council decided that it should not itself undertake the work of issuing its own reports but should put this into the hands of a publishing house with experience of publishing mental tests which could secure for its works international publicity. It accordingly appointed as official publishers the University of London Press Ltd., which arranges on a commission basis for the publication of the Council reports, for advertising them and for displaying them at educational exhibitions. By instruction of the Council its publications are printed in Scotland.

To make the publications readily available to teachers the prices have been established at a figure now hardly economic, and for special works cheap editions have been produced for members of the Educational Institute of Scotland and of Education Authorities.

The Council undertakes the publication not only of reports of investigations carried out by its own Committees or sponsored by itself, but also of researches conducted independently and considered worthy of publication. These latter have for the most part been devoted to subjects of historical interest, as, for example, *Education in Angus* and *The History of Mathematical Teaching in Scotland*. A series of Research Supplements was issued free with the *Scottish Educational Journal* from 1930 to 1933 to familiarise teachers in Scotland with the technique of research and with the work of the Council.

A complete list of the Council's publications with the date of issue will be found in Appendix II on p. 43.

### *Library*

Technical journals and works, statistical tables, bibliographies, etc., are acquired for consultation by, or for loan to, investigators conducting research. An effort is made to assemble a complete file of all mental and scholastic tests. Periodicals dealing with educational research in the libraries of Universities and Training Colleges have been located and recorded so that inquirers may be directed to the appropriate source. A list of the titles of all theses submitted in partial fulfilment of the requirements of the degrees in Education at the Scottish Universities and of theses for the higher degrees of Ph.D., D.Sc. and M.D. dealing with educational subjects has been compiled, and where these have not been published copies have been collected or abstracts made. Publications of Bodies on the Research Council's Exchange List, mainly abroad, are received and thus made available in this country.

## INVESTIGATIONS

### Educational Organisation

*Size of School*

By the application of standardised intelligence and achievement tests a comparison instituted between pupils at the Qualifying stage in city and in rural schools showed that both in intelligence and in attainment the small country schools and the large town or city schools show to better advantage than schools of medium size. The individual attention possible in small schools, and the better school organisation possible in large schools, may, at least in part, be responsible for this difference. This investigation was reported in 1938 in *City and Rural Schools: A Comparison of the Qualifying Candidates.*

*Nomenclature of Classes*

The Council in 1934 proposed to the Scottish Education Department that, in view of the difficulties arising in investigations through the necessity for adding explanatory notes to the instructions whenever reference was made to the nomenclature of classes in the Primary School (Junior Division between the ages of 7 and 9, Senior Division between the ages of 9 and 12), the classes might be designated from the lower end, thus: Infant Division; Primary I, II, III, IV, V. The Day Schools (Scotland) Code Minute, 1939, gave effect to this suggestion.

### *Effect of School-Entering Age on Attainment*

The application of a battery of American achievement tests to a complete age-group, "eleven-year-olds" in all Fife schools, revealed that in general level of achievement Fife "eleven-year-olds" are sixteen months ahead of American children of the same age. A subsidiary investigation substantiated that the lead held at 11½ is also present at 7½. This advantage of Scottish pupils in educational achievement is attributed mainly to the extra fifteen months of schooling. It would thus appear that the practice customary in Scotland of admitting children to school a year or fifteen months earlier than in America is justified on educational grounds. This investigation was completed and published in 1934 under the title, *Achievement Tests in the Primary School.*

### *Age-Grade Distribution of Primary Pupils*

From 3,084 schedules returned by Scottish schools in 1937 it would appear that the percentage of pupils retarded two years or more, according to school grading, was 7·82, whereas the percentage expected on the basis of IQ * according to the distribution of intelligence found in *The Intelligence of a Representative Group of Scottish Children,* was 13·27. The corresponding percentage of acceleration was at best 0·33, as against 16·93 expected—that is, either the best pupils are being retarded, or, possibly as a consequence of class teaching in large classes, the standards set may be too high for all but the very best pupils. The results of this inquiry were published in 1939 under the title, *Scottish Primary School Organisation*. The results for each Education Area were made available in confidence to the Director of Education for the Area so that they might be compared with those for Scotland as a whole.

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* For explanation of IQ see p. 23.

## *Time-Allocation to Primary-School Subjects*

In the same inquiry returns from the same number of schools for 28 school subjects or divisions of subjects, and for 7 different school classes, gave convincing evidence of the lack of uniformity in the allocation of time to the majority of the subjects in the curriculum. Until further educational research has established the optimum time allotment for subjects, teachers are advised to accept the median figures presented as a standard against which to measure their own practice in the light of the performance of the finished product of the primary school.

## *Examinations*

In 1930 the Carnegie Corporation of America invited the co-operation of the Research Council in the investigation of certain aspects of examinations. At a conference of the International Examinations Inquiry held in Eastbourne in 1931 the Scottish Committee submitted proposals for the completion of two investigations already initiated, the time devoted in Scottish schools to examinations compared with the time devoted to teaching, and the value of teachers' estimates of pupils' ability compared with examination results. The outcome of these investigations was published in Supplement No. 7 to the *Scottish Educational Journal* in 1932. The most interesting facts that emerged were the divergence in the number of hours spent on examinations in schools in the same area, the time devoted to examinations in some schools amounting to as much as 15 per cent. of the teaching time, and the unreliability of teachers' judgments.

### *Technique for Promotion to Secondary Education*

Under the auspices of the International Examinations Inquiry the Council undertook an investigation into the relative merits of the various procedures—traditional Qualifying or Control examination, scholastic tests, intelligence tests, teachers' estimates—in ordinary use in Scotland for promotion to secondary education. The investigation was as comprehensive and as complete as the circumstances of the times allowed. In addition to the test results a follow-up of the original 3,000 pupils was involved. The practical conclusion reached was that, on all the determining tests, IQ (Intelligence Quotient)* + Qualifying Examination + teachers' estimates (scaled) comes out as the best battery, and as far as the order of merit of the single measures is concerned, the finding is that an examination carefully set and corrected by one competent examiner is the best single basis for the prediction of a pupil's success in the secondary school. It should perhaps be added that the Qualifying Examination lasted for 3¼ hours, but the Intelligence Test only for 45 minutes plus 10 minutes for preparatory practice. Thereafter the order is, teachers' scaled marks, scholastic tests and IQ. To remove the incubus of an external Qualifying Examination from the primary school it has been suggested that an intelligence test plus teachers' estimates scaled on its results might suffice, but it has been shown that by this procedure the marks for all pupils from a particular school might be in error by as much as 12 per cent. To contribute to the attainment of this aim nevertheless the following steps should be taken: improvement of teachers' standards of marking, for example by encouraging them to make more use of standardised tests; replacement of the present intelligence tests by some kind of composite test, which, while including English and Arithmetic, would be free from the evils of external examination; increase in the flexibility of the secondary system in the first year in such a way that transferences could be easily made and mistakes in selection rectified. The full report was published in 1942 under the title, *Selection for Secondary Education*.

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* See p. 23.

### *Allocation of Pupils to different Secondary Courses*

In 1931 a Committee was appointed to explore the possibility of devising tests for determining *types* of ability at the Qualifying stage to enable pupils to be directed into the appropriate secondary-school course. The tests which ultimately proved most valuable were found to be

(*a*) Ability for English subjects and Modern Languages—the "Words" test;
(*b*) Ability for Mathematics and Engineering (including Technical Drawing)—the "Algebra" and "Geometry" tests;
(*c*) Ability for Science subjects generally — the "Science" and "Algebra" tests in combination;
(*d*) Ability for Technical subjects (Day School Higher Certificate stage)—the "Science" and "Geometry" tests in combination.

The tests and the investigation are described in *Tests of Ability for Secondary School Courses*, published in 1936, and the views expressed have recently been independently elaborated by F. M. Earle in *Reconstruction in the Secondary School* (University of London Press, Ltd., 1944).

### *Prognostic Value of the Leaving Certificate for Success at University*

A project sponsored by the International Examinations Inquiry aimed at determining the efficiency of the methods of admission to Scottish universities, the chief of which is the Leaving Certificate. Scholastic records were correlated with the academic records of university graduates who had entered a Scottish university in a given year. It was found that there was no significant difference between the prognostic value of the teacher's marks and that of the Scottish Education Department's marks for success either in the university class examinations or in the degree examinations, but in considering the value of the teacher's estimate it has to be borne in mind that it can hardly fail to be influenced by his experience of the objective standard of the Leaving Certificate Examination. A striking fact is the smallness of some of the correlation coefficients, although it has to be noted that all the coefficients have been reduced by the fact that the data from which they were computed refer only to the pupils successful at the Leaving Certificate Examination; no information, naturally, was available regarding students denied admission to University by reason of failure at the Leaving Certificate Examination who might have made good. *The Prognostic Value of University Entrance Examinations in Scotland* was published in 1936.

### *Comparative Education*

Probably the first attempt to put comparative education on a scientific basis was the application of American achievement tests in Fife (see p. 15), an investigation initiated and sponsored by the Research Council. The results were not unfavourable to the primary schools in Scotland. Repeated references have been made to this investigation in American educational literature, as, for instance, in *Conference* *on Examinations II*, at Folkestone, 1935 (pp. 296–99) (Bureau of Publications, Teachers College, Columbia University, New York, 1936).

### School Subjects

*Curriculum for the Post-Primary (Advanced) Division*

At the urgent request of the Educational Institute of Scotland, and in anticipation of the raising of the school age, the Council agreed in 1929 to undertake an investigation into the curriculum appropriate to pupils of 12 to 15 years of age. Thirteen panels were set up and over sixty meetings were held. A work of some 350 pages was published in 1931 under the title, *Curriculum for Pupils of Twelve to Fifteen Years (Advanced Division)*, presenting the results of the deliberations of the various panels. The reports of the respective panels were also issued separately. Only with considerable reluctance was this task undertaken, as it was fully realised that to execute it in a scientific way deserving the title of *research* was beyond the Council's resources. Its results were nevertheless generally welcomed, and the work was reprinted in 1932. Over 9,000 copies of the individual reports have been sold.

*Methods of Teaching*

*Arithmetic.*—Two volumes of *Studies in Arithmetic* (1939 and 1941) have been issued by the Council. The first comprised Time Allocation to Arithmetic in the Primary School, Analysis of Replies to a Questionnaire in regard to Certain Processes and Topics in the Teaching of Arithmetic, The Relative Difficulty of the Basic Number Facts, Adding Upward versus Adding Downward, Correlations between Tests in Mechanical Operations and Reasoning Arithmetic, and a Factorial Analysis of the Coefficients; the second, Vocabulary of Arithmetic, The Relative Merits of Methods of

Teaching Subtraction, The Zero in Elementary Arithmetic, Types of Errors in the Basic Number Facts, An Analysis of Errors in Fractions and Placement of Topics in Arithmetic. In 1942 *The Early Development of Number Concepts* appeared. The topics dealt with included The Arithmetical Background of Children Entering School, Number Situations, with a Note on Finger Counting, Number Games, Number Pictures. An abstract of the investigations and conclusions from these three volumes was published in 1943 under the title, *The Teaching of Arithmetic*. It arranges the recommendations made and the conclusions reached in these publications under the appropriate processes and according to the usual order adopted in the teaching of the subject, thus presenting the findings to teachers in a convenient form.

*Reading.*—In 1938 the Council published *The Standardisation of a Graded Word Reading Test*. It provided Scottish norms for Burt's Graded Word Reading Test and a new scale more suited to Scottish conditions. The test material was reprinted separately on cards to suit the convenience of teachers.

*Spelling.*—A technique for testing spelling which, in addition to securing accuracy of measurement, eliminates the subjective element involved in dictation of words by different teachers under different conditions has been approved by the Council.

*Punctuation.*—A method has been devised whereby punctuation at the Qualifying stage can be tested and scored objectively. For the purpose of testing at this stage the punctuation marks have been limited to (*a*) automatic stops (mark of interrogation, quotation marks and apostrophe), and (*b*) functional stops (periods, commas and capitals).

*Practical Problems in Teaching Method*

The Council contributed towards the cost of an investigation into practical problems in teaching

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method undertaken in 1938, in which stenographic reports of actual lessons were made in order to provide material on which to base lessons in educational method. The results of this work were published independently under the name, *Practical Problems in Teaching Method: Case Studies of Teaching Method in the Post-Primary School* by D. F. Anderson (University of London Press, Ltd., 1938).

### *Colour Blindness*

As approximately 7½ per cent. of boys are for practical purposes colour blind, and as pupils handicapped by this disability usually pass through school undetected and in some cases are misjudged as a consequence, a *Group Test for Colour Blindness* was prepared at the Council's request which has been in considerable use in Scottish schools.

### *Teaching Aids*

In December 1930 a Committee on Visual Aids in Education was appointed to explore the possibilities of the various forms of, and appliances for, visual illustration in schools. The Committee naturally devoted its attention mainly to the cinema film and prepared a Teacher's Appraisal Form. In the course of its preparation questions were encountered which necessitated a knowledge of the pupils' reactions to films, and this led to the preparation of a Pupil's Appraisal Form. These appraisal forms provide a plan which teachers can adopt to arrive at a more analytic and objective evaluation of films for class teaching than the general impression on which selection of films has hitherto usually been based. Producers should also find the decisions of the Committee enlightening in regard to educational requirements. The appraisal forms appear as appendices to the report of the Committee on Visual Aids published in 1940 under the title, *The Assessment of Educational Films*.

## MENTAL TESTING

One of the most valuable instruments in educational research is the new-type or objective test. Its distinguishing feature is the consistency with which answers can be assessed—a consistency not possible in the older type of examination question. The intelligence test is the best known example; but the method has been extended to the school subjects under the title of attainment or achievement test. A. Binet, the French psychologist, was the first to attempt to estimate intelligence objectively, and to introduce the concept of "mental age." His earliest scale of intelligence appeared in 1905. Various English translations and amplifications have been made, but the version in most general use is that prepared by Professor Terman of Leland Stanford University, California. As a measure of relative brightness or dullness the intelligence quotient (IQ) was introduced by Stern; it is calculated from the formula $\frac{\text{Mental Age}}{\text{Chronological Age}} \times 100$. A pupil whose mental age corresponds exactly with his chronological age has therefore an IQ of 100. IQ 100 is consequently assumed to indicate the mean or average IQ. (For an account of the history of the intelligence test see *The Terman-Merrill Intelligence Scale in Scotland.*)

The early supplements to the *Scottish Educational Journal* reported applications of intelligence tests. No. 2 was entitled *A Mental Survey of a Scottish Suburban School*, and to cover the cost of the testing material for this investigation the Council made a grant. No. 8, entitled *Secondary School Pupils' Attainments*, gave an account of an investigation in a typical Scottish county to discover by means of a group intelligence test the IQ necessary for success in the Leaving Certificate.

### *The 1932 Survey*

The most ambitious attempt made by the Council to apply intelligence tests, and so far the only nation-wide survey ever undertaken, was the application in 1932 of a group test especially prepared for the purpose to a complete age-group, namely, the pupils in Scotland born in 1921. A full account of this survey is given in *The Intelligence of Scottish Children.* All pupils 11 years of age in the public schools, no matter in what class they chanced to be, all the children attending private schools (with a few negligible exceptions), and all children housed in institutions were included. The test applied was a group test of the usual verbal type, but a set of pictorial classification items was included for the benefit of the weaker pupils. The data suggested that the average or mean IQ of Scottish boys born in 1921 was very close to 100 and that the average IQ of girls might be somewhat less, although the conclusion reached was that there was no proof of a significant difference between boys and girls in average IQ.

For purposes of educational organisation it is almost more important to know how pupils are distributed around the mean than what the mean IQ of Scottish pupils actually is. If a considerable number of pupils are grouped round the mean, school organisation is facilitated, whereas if the number so placed is small more provision has to be made for exceptional and abnormal pupils. The measure of this dispersion is in statistical terminology referred to as "the standard deviation." The distribution obtained from the results of the 1932 Survey produced a standard deviation of 17 for boys and 16 for girls. If 100 be regarded as the mean IQ, then, in accordance with certain properties of the normal frequency curve, 68·27 per cent. of boys have IQs between 83 and 117 (that is, within a range of 17 or one standard deviation above and below 100—the mean IQ) and 94·45 per cent. lie between 66 and 134 IQ (that is, between ± two standard deviations). As it is customary to regard any person deviating above or below the mean by more than twice the standard deviation as exceptional, we can infer that the number of 'special' pupils for whom provision would have to be made is less than 5 per cent., half of whom might be regarded as subnormal and half as supernormal. A larger standard deviation would increase the estimated amount of mental deficiency in the community, and some tests in common use have standard deviations up to 20 and 25. This brief explanation for readers not versed in the technique and terminology of statistics may indicate the significance of determining for a complete age-group of pupils not only the average IQ but also the standard deviation.

As the group test used in the 1932 Survey only allowed the means and the standard deviations to be computed, it was deemed advisable to test a random sample with an individual test. A thousand of the pupils, whose scores on the group test were available, were consequently tested with the 1916 Stanford Revision of the Binet Test. To satisfy the requirements of a random sample these pupils, referred to usually as "the Binet Thousand," were selected from those born on 1st June 1921, or as near thereto as possible, and were intended to be representative of the different geographical areas. In spite of the precautions observed, the Binet Thousand proved to be a slightly superior sample, as a comparison of their group scores with the general distribution disclosed. It was nevertheless possible by making due allowance for the superiority of the Binet Thousand to infer the mean IQ for the Scottish pupils on the group test.

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### *The 1935–1937 Survey*

In spite of this achievement, the Scottish International Examination Inquiry Committee, which had adopted the intelligence-testing programme of the Research Council, was still desirous of securing for individual testing a more truly representative sample of Scottish pupils than the Binet Thousand to correct and supplement the 1932 Survey. A proposal to this effect was put to the International Inquiry on School and University Examinations at its Folkestone Conference in 1935, and the necessary subsidy was granted. To secure such an unbiassed sample as could be individually tested by one tester within a reasonable time, it was decided to test all children in Scotland born on 1st February, 1st May, 1st August, and 1st November in the year 1926. It was expected that this would produce a sample of about 1,000 children, but the group actually numbered 874, of whom 444 were boys and 430 girls. All were tested, no matter how remotely located, with the exception of one—a boy of the Irish labouring class, who with his family disappeared completely from a slum area in Glasgow. It is doubtful whether a more perfect sample could anywhere else be secured. The testing occupied 2 years and 3 months, from September 1935 to November 1937 inclusive. The age-range of the tested pupils, calculated on the basis of the date of testing, was found to be 2 years 9 months—from 8 years 11 months to 11 years 8 months. The test used was again the 1916 Stanford Revision, with very slight modifications to suit Scottish conditions. A battery of performance tests was also applied, and for the performance testing an additional tester was employed.

The results gave a mean IQ for boys of 100·51 and for girls 99·7, or for the total group, 100·11; the standard deviations were respectively 15·88, 15·26, and for the total group 15·58. The sex differences cannot be regarded as significant. In more readily intelligible form these results may be expressed as percentages thus:

| | Boys | Girls | Total |
|---|---|---|---|
| Above 129 IQ | 5·4 | 3·9 | 4·7 |
| 110–129 | 22·3 | 20 | 21·2 |
| 90–109 | 46·2 | 51·2 | 48·6 |
| 70–89 | 25·5 | 23 | 24·2 |
| Below 70 IQ | ·7 | 1·9 | 1·3 |

A representative quotient of 100 has been decided on for Scottish children, for girls as for boys. About 50 per cent. of the pupils may be regarded as "average," with rather more girls than boys; above and below this average level there are approximately 25 per cent. That the incidence of mental defect ascertained by this investigation is somewhat lower than that found in an investigation conducted in England in 1925–1927 on behalf of the Mental Deficiency Committee of the Board of Education and the Board of Control is an important contribution to educational organisation and social science. The investigation is reported in full in *The Intelligence of a Representative Group of Scottish Children.*

### *Analysis of Performance Test Data of 1935–1937 Survey*

A factorial analysis of the performance test data secured in the 1935–1937 Individual Survey was published under the title of *An Analysis of the Performance Test Scores of a Representative Group of Scottish Children.* The work throws some light on the validity of the various performance tests individually and on their intercorrelations. The relation of performance to Binet scores is also considered. Short batteries of performance tests are suggested for (*a*) predicting Binet IQ, and (*b*) ascertaining the factor common to the Binet and the performance tests. The data are recorded in such a form as to allow other statistical computations to be made by those interested.

### *Modification of Terman-Merrill 1937 Revision of the Stanford-Binet Scale*

In 1938 a Sub-Committee of the Council was set up to consider what modifications were necessary in the Terman-Merrill 1937 Revision of the Stanford-Binet Scale to render it suitable for Scottish use, and a list of the minimum alterations necessary was prepared. Copies of these modifications were distributed on request to testers using the Scale in Scotland, and all subsequent work on this Scale has taken them into account.

### *Applicability of Terman-Merrill 1937 Revision in Scotland*

The data for tests from Year VI to Year XII inclusive for Scale L of the Terman-Merrill 1937 Revision of the Stanford-Binet Intelligence Scale have recently been tabulated for 2,050 Scottish children from 6 to 12 years old. The relative difficulty and discrimination of the separate items have been assessed from the percentage of passes at five different levels of brightness in each age-group. The report of this work, under the title, *The Terman-Merrill Intelligence Scale in Scotland*, has recently been published.

### *Group Test IQs*

The Research Council sponsored a study on "The Inconstancy of Group Test IQs" published in the *British Journal of Educational Psychology*, vol. xii, Part I, February 1942, in which it is concluded that some pupils vary definitely from week to week in their ability to perform group intelligence tests; it is consequently inadvisable, where any stress is to be laid upon the result, to give only one group test of intelligence.

### *Approach to Scottish Education Department regarding Mental Testing*

In 1934 the Council approached the Scottish Education Department with a request to include in the Qualification for the Infant Mistress Endorsement under Article 51 of the Regulations for the Training of Teachers the satisfactory completion of a course in mental testing of young children.

The Council pointed out that the testing of each child on entering school and again at the date of transfer to the Junior Division would provide valuable insight into the child mind and would make available at the outset of each pupil's career a record of his capacity objectively assessed; that the tripartite division of classes and other forms of modern school organisation demanded for their success a knowledge of the mental capacity of the pupils, and that, the earlier and the oftener IQs were taken, the better would be the information available for such classification; that the value of such tests for the diagnosis of retardation and temperamental disabilities and for vocational guidance had been established; and that a knowledge of each child's IQ would be of service to H.M. Inspectors in assessing the work of pupils and of teachers. The need of such knowledge was later confirmed in the Dundee study, reported in *Selection for Secondary Education*, where it was clearly demonstrated that difference in school attainment corresponded with variations in level of intelligence in individual schools.

### *Intelligence Testing in H.M. Forces*

On 10th January 1941 a deputation from the Research Council met the Secretary of State for

Scotland to urge upon him the importance of intelligence testing in H.M. Forces in order to secure the most advantageous distribution according to ability of personnel to meet the requirements of the various branches of the Forces, and to place at the disposal of the different Services the experience and expert skill in testing of the members of the Council.

The Council also offered its services to the Air Training Corps for the testing of recruits to enable them to be allocated to the duties for which they were best endowed. Candidates for several units were tested and a score was provisionally accepted as the standard required for efficiency.

## SOCIOLOGICAL IMPLICATIONS

### *Rural and Urban Areas*

The results both in the 1932 Group Mental Survey and in the 1935–1937 Individual Survey do not support the generally accepted belief that there are marked differences in distribution of intelligence in rural and urban areas. In the Group Survey the percentage of pupils from rural or sparsely populated areas with low scores did not differ significantly from that of pupils in urban or densely populated areas, and the same conclusion held for pupils with high scores. The Individual Survey reinforced this conclusion. Scotland may be divided into the four cities, the industrial belt, and the rural areas. A subdivision of the rural areas comprising the Highlands and Islands was isolated to secure a more truly rural group. The results were:

| | Number | Mean | Standard Deviation |
|---|---|---|---|
| The Four Cities . . | 319 | 100·86 | 15·29 |
| The Industrial Belt . . | 393 | 99·19 | 16·18 |
| The Rural Areas . . | 162 | 100·92 | 14·52 |
| (Included in Rural Areas—Highlands and Islands) . | 47 | 101·79 | 13·13 |

There are no statistically significant differences, but it is interesting that the mean of the most remote and isolated districts is the highest and its standard deviation the lowest. It may be worth mentioning in this connection that perhaps nowhere has scholastic opportunity been more evenly equalised than in Scotland; 99·7 per cent. of Scottish teachers are fully trained.

### *Future of High Scorers*

A follow-up inquiry on a group of children of superior intelligence as disclosed by the 1932 Group Mental Survey was undertaken in one of the Scottish rural counties. In this inquiry two groups of children were studied, a group with IQs ranging between 95 and 105, and a group consisting of all the children in the county who in the 1932 Mental Survey Test showed IQs of 125 and over. It was established that the superior group remains superior after a period of four years. The general conclusion from the investigation was that there were a considerable number of children of superior intelligence in the county who ceased to profit by the educational system after they were 14, and moreover were entering occupations where their superior ability could not be utilised. Publication of the results of this investigation has been deferred by the calls of war-time work on the services of the investigator, but when the investigation came to a temporary cessation at the outbreak of war it was shown that not more than 20 per cent. of the high scorers had taken their Higher Leaving Certificate and 12½ per cent. had proceeded or were proceeding to the University.

### *Follow-up of Binet Thousand*

The subsequent careers of the Binet Thousand were also recorded for the following seven years, and the data analysed. Educational and occupational histories were compiled for groups belonging to different intelligence levels, for the sexes separately, and taken together, and for urban and rural groups. An independent analysis of occupations was made and correlated with each IQ-group. The relation of occupation to age and to class on leaving school was worked out with respect both to initial and to final occupations—that is, to those occupations entered upon leaving school and to those held for not less than one year immediately before the close of the survey. A geographical analysis, based on the four cities, urban areas excluding the four cities, and rural areas was also made. So far as could be ascertained at the point when the outbreak of war interrupted the investigation the relation between intelligence and initial occupation did not appear to be very high, but there was some indication that there was an improvement in this situation by the time the final occupation—that is, the occupation held at the close of the follow-up—was entered.

### *Environmental Influence on Mentality*

The effect of change of environment on the mentality of children moved from a slum area under a rehousing scheme was investigated and reported in the *British Journal of Psychology*, vol. xxvii, Part II, October 1936. Beginning in 1929 about 300 of the children who had been transferred from a slum area in Glasgow were examined individually. Each was given intelligence and scholastic tests, and information was collected regarding temperament, behaviour, physique, medical history, and home conditions. The children were tested again 12 to 18 months later. The results showed that the average intelligence quotient, arithmetic ratio, and reading ratio (the last two of which measure attainment in relation to chronological age) of both boys and girls were very slightly higher at the second examination than at the first, whereas in a small control group of children who had not been removed from a slum area about half of them were slightly higher, and half slightly lower. This meant that while the control group progressed at their normal rate, there was some ground for thinking that there was a slight, just detectable acceleration in the transferred group.

The data of this investigation were employed in an investigation into "The Relationship between Fertility and Intelligence," presented in partial fulfilment of the requirements for the degree of B.Ed. of Edinburgh University and published in the *British Journal of Educational Psychology*, vol. x, Part III, November 1940 (pp. 196–211).

### *Influence of Season of Birth on Intelligence*

As the issue of the influence of season of birth on intelligence is raised from time to time the data collected in the 1935–1937 Individual Survey were examined with this in view, but no features indicating differences of any significance were observable. The facts are shown in *The Intelligence of a Representative Group of Scottish Children.*

### *Bilingualism*

An investigator spent two months in the Hebrides and, to secure a control group, two and a half months in Shetland in 1942, visiting 13 schools in the Hebrides and 18 in Shetland, in order to test 250 eleven-year-old children in each area with a battery of four group tests of intelligence (two verbal and two non-verbal). The Gaelic-speaking children in the Hebrides were also given a questionnaire designed to estimate the degree of bilinguality in their general background, and were further asked to take a specially constructed group intelligence test in Gaelic. Confirmation of the findings was sought by a second investigator who, on behalf of the Council, in October 1943 applied Cattell's Scale I (Non-Verbal) of Intelligence to Gaelic-speaking children in Lewis of age-groups 8, 10, and 12, numbering 91, 116, and 106 respectively. The instructions for Form A were given in English, which was followed by Form B for which the instructions were given in Gaelic. The gains over and above the admitted practice effects were significant and might be considered to be due to the use of Gaelic instead of English. Arrangements have been made with the schools in Lewis for a further investigation planned on a new basis, and this only awaits the convenience of the tester.

### *Evacuation*

At the outbreak of war the Council decided that some cognisance should be taken of the problems which arose as the result of war-time conditions, and that opportunities should not be neglected of initiating investigations which the dislocation of school work had made possible. A survey of these problems was made, and on 5th April 1940 a conference was called of all the Bodies interested in or concerned with evacuation in Scotland so that overlapping might be avoided. At this conference it was agreed that the Executive Committee of the Research Council should function as a co-ordinating committee. Information both from public and from private sources was assembled, from which the volume, *Evacuation in Scotland: A Record of Events and Experiments*, was prepared. While the volume as a whole has a permanent value as a record and evaluation of a great social experiment, it contains also suggestions likely to prove of real service in the treatment of post-war social and educational reconstruction. Extensive quotation from this work is made in *Our Scottish Towns: A Report by the Scottish Women's Group on Public Welfare* (William Hodge & Co., Ltd., 1944).

## PRESENT COMMITMENTS

The projects on which the Committees of the Council are at present engaged include a test to determine the attainments in arithmetic of pupils at the age of 7, which is under preparation by the Panel on Early Number Teaching of the Committee on Primary School Subjects; an investigation into the writing of figures on behalf of the same Committee, for which over a thousand samples from school pupils and adults have been collected and tabulated, and from the results of which it is proposed to construct scales of legibility and speed; a volume by the Reading Sub-Committee devoted mainly to vocabulary investigations, to be entitled *Studies in Reading*: Volume I, which will include an introductory chapter reviewing research work on the early teaching of reading, a count of words contained in the Infant Readers most frequently used in Scottish schools, a count of the vocabulary of Scottish five-year-old children, a phonetic analysis of the latter and a comparison with the vocabulary of basic English, together with a phonetic analysis of basic English, and a study of the vocabulary of children's comics.

A Panel is being formed to investigate the problems, now being formulated, involved in learning and teaching spelling, and it is hoped that another Panel will begin operations on the study of handwriting when the investigation on the writing of figures is completed.

The Council has decided to undertake publication of a work on the History of Education in Aberdeenshire similar to *Education in Angus*.

## CONCLUSION

Starting without any precedent the Council had to evolve a constitution and prepare Articles of Association for its incorporation under Board of Trade regulations. It had to make rules for the guidance of its deliberations and for the regulation of its own arrangements and its relations to other Bodies, and to decide how its finances were to be managed, what types of investigations should come within its scope and under what conditions they should be undertaken, and what form its publications should take and how they should be distributed. Office accommodation had to be secured, and administrative and clerical staff appointed. All this has been achieved with surprising unanimity, and acknowledgments of what the Council has so far accomplished have been repeatedly expressed by educationists at home and abroad, as well as in scientific publications and professional journals.

Prior to the foundation of the Council, individual workers in educational research laboured under serious handicaps. There are two important advantages which the Council has over such investigators. It can develop research both intensively and extensively in a manner beyond the power of an individual, and, when necessary, on a nation-wide scale; it can likewise initiate long-term investigations involving the keeping trace and following up of pupils over a period of years, which only an established institution can undertake. The Council has nevertheless not usurped the place of the individual investigator, but has increased his opportunities and facilitated his labours by affording him expert guidance, supplying him with literature and test material, subsidising his investigations and publishing his results.

While research procedure is slow and its results are not spectacular, these results have a degree of certainty and permanence which opinions, the statement of which may excite a readier response, do not possess; they also have a cumulative value, for not only does one investigation give rise to other lines of research, but the late investigations also follow the methods or use the results of earlier inquiries. This has frequently been illustrated in the work of the Council.

The widely representative nature of the Council's membership is a unique feature in the Scottish educational system. The Secretary of the Scottish Education Department on 12th March 1928, while deciding against direct participation in the work of the Council, expressed the hope that the Department would be kept informed of the progress of its work. This hope has been fulfilled, and in addition the relations between the Council and the Department have throughout been most cordial and, it is believed, mutually helpful. The Council provides a platform where the representatives of the various educational Bodies in Scotland meet on equal terms: the essentially democratic nature of its proceedings may be judged by the fact that on more than one occasion the Director of Education of a county has been a member of a Committee over which a teacher under the same Authority presided.

Many advantages accrue to the Council from its wide representation. Probably peculiar to the Scottish Council as distinguished from other research Bodies is the extent to which it has enlisted the help of experts who voluntarily give their services and pool their resources to advance educational research. Education Authorities not only contribute to the finances of the Council but also readily grant permission for investigations to be undertaken in their areas. Directors of Education put their administrative experience at the disposal of the Council and have repeatedly organised the distribution and collection of tests on behalf of the Council. The Educational Institute of

Scotland, in addition to affording voluntary financial support, assists the Council's work by the active co-operation of its members: offers of help from teachers in applying tests or supplying data are never lacking. The volume of work overtaken by these means and represented by its publications shows that its achievements have been substantial and justifies the inclusion of research as one of the purposes included in the Education (Scotland) Bill, 1945. Whereas in terms of Clause 81 Education Authorities are empowered to contribute to the conduct of research, under Clause 59 the Secretary of State may make provision for payment directly out of the Education (Scotland) Fund for the purpose of promoting educational research. While the Council expects that advantage will be taken of both these provisions it trusts that in the developments that may ensue the voluntary assistance and financial aid will continue.

# APPENDIX I

## LIST OF OFFICERS 1944–1945

### PRESIDENT

Rev. David Frew, D.D., LL.D., F.E.I.S.

### CHAIRMAN OF EXECUTIVE COMMITTEE

James H. Steel, M.A., D.Litt., F.E.I.S.

### CHAIRMAN OF FINANCE COMMITTEE

George Symington

### MEMBERS OF COUNCIL

*Association of County Councils in Scotland:*

Rev. J. Chambers, M.B.E., J.P., F.E.I.S., 28 Hawkhead Road, Paisley

Rev. David Frew, D.D., LL.D., F.E.I.S., Mansefield, Haugh of Urr, Castle-Douglas

J. Trotter, The Castle, New Cumnock

*Association of Counties of Cities in Scotland:*

Councillor J. B. Stewart Lamb, J.P., 7 Northfield, Liberton, Edinburgh

George Symington, 180 West Regent Street, Glasgow

*Educational Institute of Scotland:*

Alexander J. Belford, J.P., M.A., F.E.I.S., 5 Moray Place, Edinburgh

George A. Lawrence, M.A., F.E.I.S., Training Centre, St Andrew Street, Aberdeen

* Miss Annie C. Maclarty, M.B.E., J.P., F.E.I.S., The Academy, Kilmarnock

Alex. M. Orr, M.A., B.Sc., Rothesay Public School, Rothesay

James Porter, M.A., F.E.I.S., Royal Academy, Irvine

Herbert J. L. Robbie, M.A., Ph.D., F.E.I.S., The Academy, Bathgate

* James H. Steel, M.A., D.Litt., F.E.I.S., 9 Sutherland Avenue, Glasgow

James Younie, F.E.I.S., Park School, Alloa

*Association of Directors of Education in Scotland:*

John Crawford, O.B.E., M.A., Ed.B., LL.B., Education Office, Castle-Douglas

* W. A. F. Hepburn, O.B.E., M.C., M.A., B.Ed., LL.D., F.R.S.E., Lanarkshire House, 191 Ingram Street, Glasgow

T. MacLaren, M.A., B.Sc., Ph.D., L.C.P., F.E.I.S., Education Office, Elgin

J. Morrison, M.B.E., M.A., B.Sc., County Education Office, 22 Union Terrace, Aberdeen

W. D. Ritchie, M.A., Education Office, Galashiels

*National Committee for the Training of Teachers:*

* W. W. McClelland, M.A., B.Sc., B.Ed., F.E.I.S., 140 Princes Street, Edinburgh

Rev. J. M. Hunter, M.A., B.D., Manse of Abbotshall, Kirkcaldy

*Training Centres and Colleges:*

G. G. Neill Wright, M.A., B.Ed., D.Litt., Training Centre, Jordanhill, Glasgow

* George Mowat, M.A., B.Ed., Moray House School, Edinburgh

John L. Hardie, M.A., Ed.B., Training Centre, St Andrew Street, Aberdeen

* Thomas Hope, M.A., B.Ed., Training Centre, Park Place, Dundee

*Universities:*

Andrew F. Skinner, M.A., B.Sc., Ph.D., Professor of Education, The University, St Andrews

* William Boyd, M.A., B.Sc., D.Phil., D.Litt., F.E.I.S., The University, Glasgow

* Norman T. Walker, M.A., Ed.B., Ph.D., F.E.I.S., The University, Aberdeen

* Godfrey H. Thomson, Ph.D., D.Sc., D.C.L., Professor of Education, The University, Edinburgh

*British Psychological Society (Scottish Branch):*

* James Drever, M.A., B.Sc., D.Phil., F.R.S.E., R.S.O., Professor of Psychology, The University, Edinburgh

David Kennedy-Fraser, M.A., B.Sc., F.R.S.E., Edge o' the Moor, Milngavie, Dunbartonshire

*Association of School Medical Officers of Scotland:*

* John Hunter, M.B., Ch.B., D.P.H., School Medical Officer, West Lothian Education Committee

* John Macintyre, M.B., Ch.B., D.P.H., The Neuk, Lanark

## DIRECTOR

* Robert R. Rusk, M.A., B.A., Ph.D.

## HONORARY SECRETARY AND TREASURER

John Wishart, M.A., F.E.I.S.

*Secretarial Assistant*

Miss F. Doreen Gullen, M.A., B.Litt.

* Members of the original full Council of 1928.

# APPENDIX II

## *PUBLICATIONS OF THE SCOTTISH COUNCIL FOR RESEARCH IN EDUCATION*

I. SCOTTISH SPINNING SCHOOLS (1930). With eight half-tone illustrations. By Irene F. M. Dean, F.R.Hist.S.

II. EDUCATION IN ANGUS (1931). By J. C. Jessop, M.A., Ph.D., F.R.Hist.S.

III. CURRICULUM FOR PUPILS OF TWELVE TO FIFTEEN YEARS (1931). Thirteen Reports.

1. English.
2. History.
3. Geography.
4. Mathematics.
5. Science (Physical and Biological).
6. Music.
7. Art and Craftsmanship.
8. Physical Education (including Games).
9. Domestic Arts and Crafts.
10. Technical Subjects.
11. Commercial Subjects.
12. Rural Subjects.
13. Languages.

IV. GROUP TEST FOR COLOUR-BLINDNESS (1932, revised edition 1933). Prepared by Dr Mary Collins, University of Edinburgh, and Professor James Drever, University of Edinburgh. Lithographed by C. C. Parkinson, Heriot-Watt College, Edinburgh.

V. THE INTELLIGENCE OF SCOTTISH CHILDREN (1933). A National Survey of an Age-Group.

VI. ACHIEVEMENT TESTS IN THE PRIMARY SCHOOL (1935). A Comparative Study with American Tests in Fife. By Gregor MacGregor, M.A., formerly Director of Education for Fife.

VII. A HISTORY OF SCOTTISH EXPERIMENTS IN RURAL EDUCATION (1935). From the eighteenth century to the present day. By JOHN MASON, M.A., Ph.D.

VIII. THE HISTORY OF MATHEMATICAL TEACHING IN SCOTLAND (1935). By DUNCAN K. WILSON, M.A., B.Sc., Ph.D.

IX. THE PROGNOSTIC VALUE OF UNIVERSITY ENTRANCE EXAMINATIONS IN SCOTLAND (1935).

X. TESTS OF ABILITY FOR SECONDARY SCHOOL COURSES (1936). By F. M. EARLE, M.Ed., D.Sc.

XI. CITY AND RURAL SCHOOLS (1938). A Comparison of the "Qualifying" Candidates. By ALEX. S. MOWAT, M.A., B.Ed.

XII. THE STANDARDISATION OF A GRADED WORD READING TEST (1938). By P. E. VERNON, M.A., Ph.D.

XIII. STUDIES IN ARITHMETIC, VOLUME I (1939).

XIV. SCOTTISH PRIMARY SCHOOL ORGANISATION (1939). Age-Grade Classification. Time-Allocation to Subjects.

XV. THE INTELLIGENCE OF A REPRESENTATIVE GROUP OF SCOTTISH CHILDREN (1939). By A. M. MACMEEKEN, M.A., B.Ed., Ph.D.

XVI. AN ANALYSIS OF PERFORMANCE TEST SCORES OF A REPRESENTATIVE GROUP OF SCOTTISH CHILDREN (1940). By GODFREY H. THOMSON, Ph.D., D.Sc., D.C.L.

XVII. THE ASSESSMENT OF EDUCATIONAL FILMS (1940).

XVIII. STUDIES IN ARITHMETIC, VOLUME II (1941).

XIX. SELECTION FOR SECONDARY EDUCATION (1942). By WILLIAM MCCLELLAND, M.A., B.Sc., B.Ed.

XX. STUDIES IN EARLY NUMBER TEACHING (1942).

XXI. THE TEACHING OF ARITHMETIC (1943). By JOHN MORRISON, M.A., B.Sc.

XXII. EVACUATION IN SCOTLAND (1944). A Record of Events and Experiments. Edited by WILLIAM BOYD, M.A., B.Sc., D.Phil., D.Litt.

XXIII. THE TERMAN-MERRILL INTELLIGENCE SCALE IN SCOTLAND (1945). By D. KENNEDY-FRASER, M.A., B.Sc., F.R.S.E.

XXIV. THE SCOTTISH COUNCIL FOR RESEARCH IN EDUCATION: ITS AIMS AND ACTIVITIES (1945).

1932 MENTAL SURVEY TEST.

Test material from THE STANDARDISATION OF A GRADED WORD READING TEST

1. THE GRADED WORD READING TEST
2. THE BURT (REARRANGED) WORD READING TEST

## SUPPLEMENTS TO *THE SCOTTISH EDUCATIONAL JOURNAL*

INDIVIDUAL DIFFERENCES IN TEMPERAMENT (April 1930). By W. A. F. Hepburn, O.B.E., M.C., LL.D., Director of Education to the Lanarkshire Education Committee.

A MENTAL SURVEY OF A SCOTTISH SUBURBAN SCHOOL (May 1930). By Sister Marie Hilda.

AGE CORRECTION AS AN EXPLANATION OF THE DISCREPANCY BETWEEN SCHOLASTIC ATTAINMENT AND MENTAL TEST RESULTS (March 1931). By Flora Kennedy, M.A., Ed.B.

WHY CHILDREN LEAVE THE SECONDARY SCHOOL (April 1931). By Margaret C. McCluskey, M.A., Ed.B.

AN EXPERIMENTAL STUDY IN SPELLING (June 1931). By Agnes M. Bernard, M.A., Ed.B.

RELATION OF READING COMPREHENSION TO ARITHMETICAL ABILITY (December 1931). By H. R. Low, M.A., B.Sc., Ed.B.

EXAMINATION INQUIRY—TWO ASPECTS (May 1932).

SECONDARY SCHOOL PUPILS' ATTAINMENTS (June 1932).

A LATIN VOCABULARY TEST FOR FIRST AND SECOND YEAR PUPILS (March 1933). By Wm. B. Tudhope, M.A., B.Ed.

ARITHMETIC IN SCOTTISH SCHOOLS (April 1933). By John Murray, M.A., Ph.D., F.R.S.E.

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